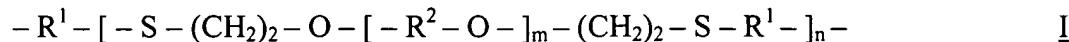


**Amendments to the Specification**

*Col. 2, lines 21-47.*

In accordance with one aspect of the present invention, there is provided a polythioether having the formula I



wherein

$R^1$  denotes a divalent  $C_{2-6}$  n-alkylene,  $C_{3-6}$  branched alkylene,  $C_{6-8}$  cycloalkylene or  $C_{6-10}$

alkylcycloalkylene group,  $-[(-CH_2)_p - X -]_q - (-CH_2)_r -$ , or  $-[(-CH_2)_p - X -]_q - (-$

$CH_2)_r -$  in which at least one  $-CH_2-$  unit is substituted with a methyl group,

$R^2$  denotes methylene, a divalent  $C_{2-6}$  n-alkylene,  $C_{2-6}$  branched alkylene,  $C_{6-8}$

cycloalkylene or  $C_{6-10}$  alkylcycloalkylene group,  $-[(-CH_2)_p - X -]_q - (-CH_2)_r -$ , or  $-$

$[(-CH_2)_p - X -]_q - (-CH_2)_r -$  in which at least one  $-CH_2-$  unit is substituted with a

methyl group,  $X$  denotes one selected from the group consisting of  $O$ ,  $S$  and  $-$

$NR^6 -$ ,

$R^6$  denotes  $H$  or methyl,

$m$  is a rational number from 0 to 10,

$n$  is an integer from 1 to 60,

$p$  is an integer from 2 to 6,

$q$  is an integer from 1 to 5, and

$r$  is an integer from 2 to 10,

the polythioether being a liquid at room temperature and pressure.

Co. 2, lines 50-65

In a first preferred embodiment, the polythioether has the formula II



wherein

A denotes a structure having the formula I,

y is 0 or 1,

$R^3$  denotes a single bond when  $y=0$  and  $-S-(CH_2)_2-[-O-R^2-]_m-O-$  when  $y=1$ ,

$R^4$  denotes  $-SH$  or  $-S-(-CH_2)_2-O-R^5$  when  $y=0$  and  $[-CH_2=CH_2] -CH=CH_2$  or  $-(CH_2)_2-S-R^5$  when  $y=1$ ,

$R^5$  denotes  $C_{1-6}$  n-alkyl which is unsubstituted or substituted with at least one  $-OH$  or  $-NHR^7$  group, and

$R^7$  denotes H or a  $C_{1-6}$  n-alkyl group.

Col. 3, lines 25-43

In a second preferred embodiment, the polythioether has the formula III



wherein

A denotes a structure having the formula I,

y is 0 or 1,

$R^3$  denotes a single bond when  $y=0$  and  $-S-(CH_2)_2-[-O-R^2-]_m-O-$  when  $y=1$ ,

$R^4$  denotes  $-SH$  or  $-S-(CH_2)_2-O-R^5$  when  $y=0$  and  $[-CH_2=CH_2]$   $\underline{-CH=CH_2}$  or  $-$

$(CH_2)_2-S-R^5$  when  $y=1$ ,

$R^5$  denotes  $C_{1-6}$  n-alkyl which is unsubstituted or substituted with at least one  $-OH$  or  $-$

$NHR^7$  group, and

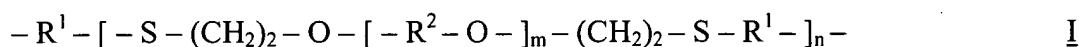
$R^7$  denotes H or a  $C_{1-6}$  n-alkyl group $[[.]]$ ,

$z$  is an integer from 3 to 6, and

B denotes a  $z$ -valent residue of a polyfunctionalizing agent.

Col. 5, lines 25-50

In their most general aspect, the inventive polythioethers include a structure having the formula I



wherein

$R^1$  denotes a divalent  $C_{2-6}$  n-alkylene,  $C_{3-6}$  branched alkylene,  $C_{6-8}$  cycloalkylene or  $C_{6-10}$  alkylcycloalkylene group,  $-[(-CH_2)_p-X-]_q-(-CH_2)_r-$ , or  $-[(-CH_2)_p-X-]_q-(-CH_2)_r-$  in which at least one  $-CH_2-$  unit is substituted with a methyl group,

$R^2$  denotes methylene, a divalent  $C_{2-6}$  n-alkylene,  $C_{2-6}$  branched alkylene,  $C_{6-8}$  cycloalkylene or  $C_{6-10}$  alkylcycloalkylene group,  $-[(-CH_2)_p-X-]_q-(-CH_2)_r-$ , or  $-[(-CH_2)_p-X-]_q-(-CH_2)_r-$  in which at least one  $-CH_2-$  unit is substituted with a methyl group,

X denotes one selected from the group consisting of O, S and  $-NR^6-$ ,

$R^6$  denotes H or methyl,

m is a rational number from 0 to 10,

n is an integer from 1 to 60,

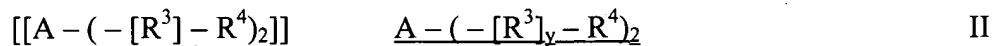
p is an integer from 2 to 6,

q is an integer from 1 to 5, and

r is an integer from 2 to 10.

Col 6, lines 40-55

A first preferred embodiment of the inventive polythioethers has the formula II



wherein

A denotes a structure having the formula I,

y is 0 or 1,

$R^3$  denotes a single bond when  $y=0$  and  $-S-(CH_2)_2-[-O-R^2]_m-O-$  when  $y=1$ ,

$R^4$  denotes  $-SH$  or  $-S-(-CH_2)_2-O-R^5$  when  $y=0$  and  $[-CH_2=CH_2] -CH=CH_2$  or  $-$

$(CH_2)_2-S-R^5$  when  $y=1$ ,

$R^5$  denotes  $C_{1-6}$  n-alkyl which is unsubstituted or substituted with at least one  $-OH$  or  $-$

$NHR^7$  group, and

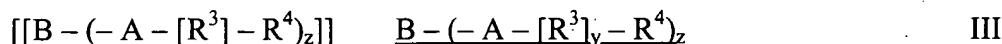
$R^7$  denotes H or a  $C_{1-6}$  n-alkyl group.

Col. 7, lines 4-7

In a more particular preferred embodiment of the foregoing polythioether, when  $m=1$  and  $R^2 = n\text{-butylene}$  in formula II,  $R^1$  is not ethylene or n-propylene. Also preferably, when  $m=1$ ,  $p=2$ ,  $q=2$ ,  $r=2$  and  $R^2 = \text{ethylene}$ ,  $X$  is not O.

Col. 7, line 53 to col. 8, line 4.

Polyfunctional polythioethers according to the present invention thus preferably have the formula III



wherein

$A$  denotes a structure having the formula I,

$y$  is 0 or 1,

$R^3$  denotes a single bond when  $y=0$  and  $-S-(CH_2)_2-[-O-R^2]_m-O-$  when  $y=1$ ,

$R^4$  denotes  $-SH$  or  $-S-(-CH_2)_2-O-R^5$  when  $y=0$  and  $[-CH_2=CH_2] - \underline{CH=CH_2}$  or  $-$

$(CH_2)_2-S-R^5$  when  $y=1$ ,

$R^5$  denotes  $C_{1-6}$  n-alkyl which is unsubstituted or substituted with at least one  $-OH$  or  $-$

$NHR^7$  group,

$R^7$  denotes H or a  $C_{1-6}$  n-alkyl group,

$z$  is an integer from 3 to 6, and

$B$  denotes a  $z$ -valent residue of a polyfunctionalizing agent.

Col. 8, lines 63-67.

The compounds of formula IV are dithiol compounds. Preferred dithiols include those compounds in which  $R^1$  is a divalent  $C_{2-6}$  n-alkylene group, i.e., 1,2-ethanedithiol, 1,3-propanedithiol, 1,4-butanedithiol, 1,5-pentanedithiol or 1,6-hexanedithiol.

Col 9, lines 1-10.

Additional preferred dithiols include those compounds in which  $R^1$  is a divalent  $C_{3-6}$  branched alkylene group, having one or more pendent groups which can be, for example, methyl or ethyl groups. Preferred compounds having branched alkylene  $R^1$  include 1,2-propanedithiol, 1,3-butanedithiol, 2,3-butanedithiol, 1,3-pentanedithiol, 1,3-dithio-3-methylbutane and 2,3-butanedithiol. Other useful dithiols include those in which  $R^1$  is a divalent  $C_{6-8}$  cycloalkylene or  $C_{6-10}$  alkylcycloalkylene group, for example, dipentenedimercaptan and ethylcyclohexyldithiol (ECHDT).

Col. 9, lines 47-62.

Exemplary divinyl ethers include those compounds in which  $R^2$  is  $C_{2-6}$  n-alkylene or  $C_{2-6}$  branched alkylene. Preferred divinyl ethers of this type include ethylene glycol divinyl ether (EG-DVE) ( $R^2$ =ethylene,  $m=1$ ); butanediol divinyl ether (BD-DVE) ( $R^2$ =butylene,  $m=1$ ); hexanediol divinyl ether (HD-DVE) ( $R^2$ =hexylene,  $m=1$ ); diethylene glycol divinyl ether (DEG-DVE) ( $R^2$ =ethylene,  $m=2$ ); triethylene glycol divinyl ether ( $R^2$ =ethylene,  $m=3$ ); and tetraethylene glycol divinyl ether ( $R^2$ =ethylene,  $m=4$ ). Useful divinyl ether blends include “PLURIOL®” type blends such as PLURIOL® E-200 divinyl ether (commercially available from BASF), for which  $R^2$ =ethylene and  $m=3.8$ , as well as “DPE” polymeric blends such as

DPE-2 and DPE-3 (commercially available from International Specialty Products, Wayne, N.J.).

Of these, DEG-DVE and PLURIOL® E-200 are particularly preferred.

Col. 9, lines 63-67

Useful divinyl ethers in which R<sup>2</sup> is C<sub>2-6</sub> branched alkylene can be prepared by reacting a polyhydroxy compound with acetylene. Exemplary compounds of this type include compounds in which R<sup>2</sup> is an alkyl-substituted methylene group such as -CH<sub>2</sub>(CH<sub>3</sub>)- or -CH<sub>2</sub>CH(CH<sub>3</sub>)-.

Col. 10, lines 52-59

According to another preferred method, (n) equivalents of a compound having the formula [[!V]] IV, or a mixture of at least two different compounds having the formula IV, are reacted with (n+1) equivalents of a compound having the formula V, or a mixture of at least two different compounds having the formula V, again in the presence of an appropriate catalyst. This method affords an uncapped, vinyl-terminated difunctional polythioether.